

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 30 (cancelled).

31. (new) A steering system for a vehicle having first and second steerable rear wheels, said steering system comprising:

an axle having first and second end portions which are suspended by springs and which support the first and second steerable rear wheels of the vehicle, said axle having an intermediate portion which at least partially defines a chamber in said axle;

a steering member having a longitudinal central axis, said steering member being supported in said chamber in said axle for axial movement relative to said axle, said steering member having a screw thread portion;

a ball nut associated with said screw thread portion of said steering member and disposed in said chamber in said axle;

an electric motor connected with said axle;

at least one drive member connected with said electric motor and said ball nut to rotate said ball nut to move said steering member axially relative to said axle upon actuation of said electric motor;

a takeoff assembly connected to said steering member and having a portion projecting from an opening in said intermediate portion of said axle;

first steering linkage connected with said projecting portion of said takeoff assembly and extending along an outer side of said axle to transmit movement of said takeoff assembly to said first steerable rear wheel; and

second steering linkage connected with said projecting portion of said takeoff assembly and extending along the outer side of said axle to transmit movement of said takeoff assembly to said second steerable rear wheel.

32. (new) A steering system as set forth in claim 31 further comprising a spring assembly disposed in said chamber in said axle, said spring assembly biasing said steering member toward a straight ahead position.

33. (new) A steering system as set forth in claim 31 further comprising a spring assembly disposed in said chamber in said axle, said spring assembly comprises a single spring acting to bias said steering member toward a straight ahead position when said steering member is moved from the straight ahead position.

34. (new) A steering system as set forth in claim 33 wherein fixed stops are disposed in said chamber in said

axle and capture said spring between said fixed stops when said steering member is in the straight ahead position, said steering member having movable stops that are movable relative to said fixed stops to compress said spring upon movement of said steering member from the straight ahead position.

A | 35. (new) A steering system as set forth in claim 31 further comprising a spring assembly disposed in said chamber in said axle, said takeoff assembly comprising a piston located between said ball nut and said spring assembly, said spring assembly being effective to urge said takeoff assembly toward a straight ahead position.

36. (new) A steering system as set forth in claim 35 further comprising stop means spaced apart from said piston and acting between a spring in said spring assembly and said steering member for transmitting biasing force of said spring to said steering member.

37. (new) A steering system as set forth in claim 31 further including a first spring member acting between said takeoff assembly and said axle, said first spring member biasing said takeoff assembly and thereby said steering member in a first axial direction toward a straight ahead position, and a second spring member acting between said takeoff assembly and said axle, said second spring member

biasing said takeoff assembly and thereby said steering member in a second axial direction opposite the first axial direction and toward the straight ahead position.

A | 38. (new) A system as set forth in claim 31 wherein said takeoff assembly includes a piston member connected with said steering member and supported in said axle for movement with said steering member relative to said axle, said piston member having axially opposed first and second end surfaces, a first spring member acting between said first end surface of said takeoff assembly and said axle, and a second spring member acting between said second end surface of said takeoff assembly and said axle.

39. (new) A steering system as set forth in claim 31 further comprising a motor control system operative to enable the generation of back EMF in said motor upon movement of said steering member toward the straight ahead position in order to resist movement of said steering member toward the straight ahead position.

40. (new) A steering system as set forth in claim 31 wherein said electric motor is located outside said chamber in said axle, said drive member extends through an opening formed in said axle.

41. (new) A steering system as set forth in claim 31 wherein said steering member is free of rack teeth.

42. (new) A steering system as set forth in claim 31 wherein said electric motor is effective to resist movement of said steering member toward a straight ahead position.

43. (new) A system as set forth in claim 32 further comprising a locking member for locking said steering member in a straight ahead position.

A | 44. (new) A steering system as set forth in claim 31 wherein said drive member is a belt which extends part way around said ball nut and part way around an output member connected with said electric motor.

45. (new) A steering system for a vehicle having first and second steerable rear wheels, said steering system comprising:

    a housing;

    a steering member having a longitudinal central axis, said steering member being supported in a chamber in said housing for axial movement relative to said housing, said steering member having a screw thread portion;

    a ball nut associated with said screw thread portion of said steering member and disposed in said chamber in said housing;

    an electric motor connected with said ball nut to rotate said ball nut to move said steering member axially

relative to said housing upon actuation of said electric motor;

a spring assembly disposed in said chamber in said housing, said spring assembly biasing said steering member toward a straight ahead position;

a takeoff assembly connected to said steering member and having a portion projecting from an opening in said housing;

A | first steering linkage connected with said projecting portion of said takeoff assembly and extending along an outer side of said housing to transmit movement of said takeoff assembly to said first steerable rear wheel; and

second steering linkage connected with said projecting portion of said takeoff assembly and extending along the outer side of said housing to transmit movement of said takeoff assembly to said second steerable rear wheel.

46. (new) A steering system as set forth in claim 45 wherein said spring assembly comprises a single spring acting to bias said steering member toward a straight ahead position when said steering member is moved from the straight ahead position.

47. (new) A steering system as set forth in claim 46 wherein fixed stops are disposed in said chamber in said

housing and capture said spring between said fixed stops when said steering member is in the straight ahead position, said steering member having movable stops that are movable relative to said fixed stops to compress said spring upon movement of said steering member from the straight ahead position.

48. (new) A steering system as set forth in claim 45 wherein said takeoff assembly comprises a piston located between said ball nut and said spring assembly, said spring assembly being effective to urge said takeoff assembly toward a straight ahead position.

49. (new) A steering system as set forth in claim 48 further comprising stop means spaced apart from said piston and acting between a spring in said spring assembly and said steering member for transmitting biasing force of said spring to said steering member.

50. (new) A steering system as set forth in claim 45 wherein said spring assembly includes a first spring member acting between said takeoff assembly and said housing, said first spring member biasing said takeoff assembly and thereby said steering member in a first axial direction toward a straight ahead position, and a second spring member acting between said takeoff assembly and said housing, said second spring member biasing said takeoff assembly and

thereby said steering member in a second axial direction opposite the first axial direction and toward the straight ahead position.

51. (new) A system as set forth in claim 45 wherein said takeoff assembly includes a piston member connected with said steering member and supported in said housing for movement with said steering member relative to said housing, said piston member having axially opposed first and second end surfaces, said spring assembly includes a first spring member acting between said first end surface of said takeoff assembly and said housing, and a second spring member acting between said second end surface of said takeoff assembly and said housing.

52. (new) A steering system as set forth in claim 45 further comprising a motor control system operative to enable the generation of back EMF in said motor upon movement of said steering member toward the straight ahead position in order to resist movement of said steering member toward the straight ahead position.

53. (new) A steering system as set forth in claim 45 wherein said electric motor is located outside said chamber in said housing, said drive member extends through an opening formed in said housing.

54. (new) A steering system as set forth in claim 45 wherein said housing is an axle which is suspended by vehicle springs and supports the first and second rear wheels of the vehicle.

55. (new) A steering system as set forth in claim 45 wherein said electric motor is effective to resist movement of said steering member toward a straight ahead position.

56. (new) A system as set forth in claim 55 further comprising a locking member for locking said steering member in a straight ahead position.

57. (new) A steering system as set forth in claim 45 wherein a belt extends part way around said ball nut and part way around an output member connected with said electric motor to interconnect said electric motor and said ball nut.

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